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PROCEEDINGS

OF THE

ENTOMOLOGICAL SOCIETY

OF

LONDON

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THE ENTOMOLOGICAL SOCIETY OF LONDON

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Some of the early volumes of the Society's Transactions are out of print, but those which are in stock can be obtained at reduced prices. Any single volume of the present series, 1868–1887, is sold at 10*s.* to Fellows. The volumes for 1868–1890, in sets of not less than five, as well as the five of the Third Series (1862–1867), can be obtained by Fellows at greatly reduced prices on application to the Librarian. The following is a price list of recently published parts of the TRANSACTIONS—

1922.—Parts I, II, £1 16*s.* 0*d.*, to Fellows, £1 7*s.* 0*d*; Parts III, IV, £2 18*s.* 0*d.*, to Fellows, £2 3*s.* 6*d.*; Part V, 10*s.*, to Fellows, 7*s.* 6*d.*

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The 1893 CATALOGUE OF THE LIBRARY, with Supplement to 1900, is published at 10*s.*; to Fellows, 7*s.* The Supplement only, 4*s.* 6*d.*; to Fellows, 3*s.*

DATES OF PUBLICATION AND NUMBERS OF PAST VOLUMES OF THE TRANSACTIONS AND PROCEEDINGS OF THE ENTOMOLOGICAL SOCIETY OF LONDON

In view of the new form and manner of issue of the Transactions and Proceedings of the Society, which commence with the issues for the year 1926, it seems advisable to call attention to the dates of issue and to the volume numbers borne by past volumes.

It will be noticed that the accompanying volume is numbered Part I of Volume 74. A glance at the table below will show how this number has been calculated.

During the years 1807, 1809 and 1812, Parts 1, 2 and 3 respectively of Vol. I of the Transactions of the Entomological Society of London were issued. The Society which published this Volume, however, although a forerunner of the present Society, was by no means its parent, and therefore its publication (only the one volume was ever issued) has not been included in our series. This commenced in 1834.

New Vol. Nos.	Old Vol. Nos.	DATES OF ISSUE OF PARTS										
		Pt. 1	Pt. 2	Pt. 3	Pt. 4	Pt. 5	Pt. 6	Pt. 7	Pt. 8	Pt. 9	Pt. 10	Pt. 11
1	1	1834	1835	1836	—	—	—	—	—	—	—	—
2	2	1837	1838	1839	1840	—	—	—	—	—	—	—
3	3	1841	1842	1842	1843	—	—	—	—	—	—	—
4	4	1845	1845	1846	1847	1847	—	—	—	—	—	—
5	5	1847	1847	1848	1848	1848	1849	1849	1849	1850	—	—
	New Series											
6	1	1850	1850	1850	1851	1851	1851	1851	1852	—	—	—
7	2	1852	1852	1852	1853	1853	1853	1854	1854	—	—	—
8	3	1854	1854	1855	1855	1855	1855	1856	1856	—	—	—
9	4	1856	1856	1857	1857	1857	1858	1858	1858	1858	—	—
10	5	1859	1859	1859	1859	1860	1860	1860	1861	1861	1861	1862
	Third Series											
11	1	1862	1862	1862	1862	1863	1863	1863	1863	1864	—	—
12	2	1864	1864	1864	1865	1865	1866	—	—	—	—	—
13	3	1864	1865	1866	1867	1868	1869	1869	—	—	—	—
14	4	1865	1867	1867	1868	1868	—	—	—	—	—	—
15	5	1865	1866	1866	1866	1867	1867	1867	—	—	—	—
74	—	1926	—	—	—	—	—	—	—	—	—	—

After the issue of Vol. 5 of the Third Series, the Volumes ceased to be numbered. Thereafter, until 1925, the Transactions and Proceedings have been issued jointly, usually in 5 parts, one volume for each year, some of the parts being issued in the year to which they belong, others in the succeeding year.

In order to overcome the difficulties resulting from this system the Council has decided that, commencing with the year 1926, the Transactions and the Proceedings will be issued as separate Volumes and shall be numbered. Since the completion of Vol. 5 of Series III fifty-eight volumes have been issued. The Volume of the Transactions for 1926 therefore becomes Vol. 74; the Volume of the Proceedings, however, will be known as Volume I.

The Transactions will consist of two parts only, and it is hoped that both will be issued during the year to which they belong. Of the Proceedings three parts will be issued, the third, containing the report of the Annual Meeting and the Presidential Address, being necessarily published in the year following that with which it deals.

THE PROCEEDINGS

OF THE

ENTOMOLOGICAL SOCIETY OF LONDON

VOL. I. 1926.

Wednesday, February 3rd, 1926.

Professor E. B. POULTON, F.R.S., President, in the Chair.

Nomination of Vice-Presidents.

The PRESIDENT announced that he had nominated Dr. H. ELTRINGHAM, Dr. K. JORDAN, and Dr. H. SCOTT as Vice-presidents for the coming year.

Election of Fellow.

The following was elected a Fellow of the Society :—R. H. HARRIS, Mpangeni, Zululand.

Exhibits.

PROOF BY DR. KUNHI KANNAN THAT THE LARVA OF *HYPERECHIA XYLOCOPIFORMIS*, WALK., PREYS UPON THE LARVA OF *XYLOCOPA TENUISCAPA*, WESTW., IN S. INDIA.—The PRESIDENT exhibited the specimens kindly sent to him by Dr. Kunhi Kannan, M.A., Ph.D., and referred to in the following letter :—

"17 *December* 1925 : *Bangalore.*

" I have pleasure in forwarding the following specimens :—

" Two ♀ *Hyperechia* [*xylocopiformis*, Walk.], imagines.

" Three pupal skins of *Hyperechia.*

" Three Xylocopid larvae apparently sucked dry.

" One *Hyperechia* larva preserved in spirit.

" Two ♂, one ♀ *Xylocopa* [*tenuiscapa*, Westw.], imagines.

" One piece of wood of *Eugenia jambolana*, Lam., showing burrows of *Xylocopa* and *Hyperechia.*

" All these insects except the imagines of the bees were taken or emerged from *Xylocopa* burrows in a dead branch of *Eugenia jambolana.*

" I am sorry I am unable to send you more of *Hyperechia* imagines. The flies failed to emerge from several pupae and most of the larvae also failed to become pupae."

The *Hyperechia* imagines were dated 24 and 31 August 1925—presumably the dates of emergence; the Xylocopid imagines—24 August, 2 ♂; 29 August, ♀. The skins of Xylocopid larvae " apparently sucked dry by Asilid found in burrow of *Xylocopa* " and also the pupal skins were dated 24 August. The *Hyperechia* larva in the tube bore the label " 24 August 1925. Larva of Asilid found in burrow of *Xylocopa* made in *Eugenia jambolana*."

It was most satisfactory that Dr. Kunhi Kannan had been able to obtain full confirmation of the conclusions suggested by his letter in *Proc. Ent. Soc. Lond.*, 1925, p. xii. The piece of wood showing the tunnels was especially beautiful and convincing, clearly showing the large tunnels of the Xylocopid larvae entered by the small tunnels of the *Hyperechia*. Major Austen, D.S.O., had kindly compared the ASILIDAE with Walker's type of *H. xylocopiformis* from Madras, in the British Museum, and Mr. B. Uvarov had kindly determined the Xylocopids.

The President said that he was sure that Fellows would wish to congratulate Dr. Kannan on his successful investigations and Dr. V. G. L. van Someren on the full confirmation of his discovery which had come to us from another continent.

A RARE BRENTHID BEETLE INTRODUCED IN AMERICAN OAK.—The President exhibited a specimen of *Platysystrophus sallei*, Power, taken by Mr. J. Gardner on a log of American oak at the docks, West Hartlepool. The specimen had been kindly determined by Herr Kleine.

TWO CATERPILLARS FROM ASSAM.—Mr. T. BAINBRIGGE FLETCHER exhibited a coloured drawing of a Geometrid larva found on leaves of *Heptapleurum hypoleucum* (Araliaceae) at Shillong on 29 June 1918. This caterpillar resembled exactly a small piece of broken twig covered with scattered tufts of green moss, but the green moss-like projections were actual outgrowths of the skin. It fed on the *Heptapleurum* leaves, usually remaining motionless by day, and ultimately pupated on 12 July; the moth, however, failed to emerge, so that it was not possible to determine to what species the caterpillar belonged.

He also exhibited photographs and coloured drawings of larvae of *Brahmaea wallichii*, Gray, found feeding on *Ligustrum* sp. at Shillong. Commenting on the systematic position usually ascribed to the BRAHMAEIDAE, he stated that pupation takes place underground and that the larva does not form a silken cocoon. He drew special attention to the long, twisted, black, stiff filaments projecting from the thoracic and posterior segments of the larva in its penultimate instar, these filaments being shed with the larval skin of this instar, and suggested that the *Brahmaea* larva in this stage, when assuming a warning attitude, may have been the original prototype of the Chinese Dragon.

ABERRATIONS OF CONTINENTAL BUTTERFLIES.—Mr. E. MARKS exhibited and made remarks on three bred examples of *Papilio podalirius* ab. *undecimlineata*, and also on two specimens of *Euvanessa antiopa* taken in August 1925 near Carcassone in the Eastern Pyrenees in which the blue spots on the hind-wings were entirely wanting.

Mr. G. FOX-WILSON, who illustrated his remarks with lantern slides, gave an account of his paper on " Insect Visitors to the Sap-exudations of Trees."

Wednesday, March 3rd, 1926.

Professor E. B. Poulton, F.R.S., President, in the Chair.

Obituary.

The President called attention to the great loss the Society had sustained by the death of Mr. W. Bateson, F.R.S., and a unanimous vote of condolence with his family was passed.

The deaths of Mr. A. E. J. Carter and of Mr. C. Fenn were also announced.

Co-option of Member of Council.

It was announced that Dr. P. A. Buxton had been co-opted to serve on the Council in the place of the late Mr. W. Bateson.

Election of Fellows.

The following were elected Fellows of the Society:—B. Blaker, Warrilow, Barnham Junction, Bognor; R. Kelly, 59, Swanston Street, Melbourne, Victoria; D. G. Sevastopulo, c/o Ralli Brothers, Karachi, India; E. B. Worthington, Caius College, Cambridge.

Exhibits.

A nest of *Acanthomyops brunneus*.—Mr. H. Donisthorpe exhibited a number of myrmecophiles taken by him in nests of *Acanthomyops* (*Donisthorpea*) *brunneus* in Windsor Forest during the past year, which brings the total of species taken by him with this ant to over fifty. He described their habits, etc., and mentioned the other species of ants they had been found with.

He also exhibited an observation nest of *A. brunneus*, which he had started in January 1925, and described the myrmecophiles present in the nest; also the very small workers bred from parthenogenitic eggs laid by workers, etc.

On the Dutch form of *Chrysophanus dispar*.—Dr. K. Jordan said: "The exhibit arises out of the project of introducing into England a race of *Chrysophanus dispar* to replace the extinct British form. Although the injudicious introduction of foreign species into the fauna should not be encouraged, one can only approve of the re-establishment of *Chr. dispar* in its old haunts and other suitable localities. It would not only be pleasant to the lover of nature to know that this beautiful butterfly again occurred in England, but the re-introduction might also have a result of no mean scientific value. If a local race is introduced which closely resembles the extinct *dispar*, it is possible that in the course of time the introduced race will assume the characteristics by which British *dispar* is distinguished from all non-British geographical varieties. The experiment should also be made with other insects and a record be kept. The race nearest the British is the one discovered during recent years in Northern Holland and recorded as true *dispar*. On comparing the two Dutch pairs in the collection of the late Hon. N. C. Rothschild with a series of British *dispar* and the plates published by Oudemans in *Tijdschr. v. Ent.*, 1922, I find that N. D. Riley was right in saying (*Entom.*, 1920, p. 10) that the Dutch specimens are not true *dispar*. On the whole, the spots on the underside are somewhat reduced, the dot near the apex of the hind-wing and the one

below the cell are decidedly smaller, the red band usually is a trifle narrower and on that account the line of dots placed on its proximal side as a rule does not approach it so closely posteriorly as in British specimens. Oberthür (*Lépid. Comp.*, xxi, p. 73, 1923) says that the Dutch *Chrysophanus* belongs to *dispar*, but that it would be convenient to distinguish it by a name indicating the locality, and he accordingly names it *batavus*."

Along with the British and Dutch specimens were shown (1) a series of specimens from Ireland, where the species has been established by Capt. Purefoy, who introduced it from the neighbourhood of Berlin, (2) some German specimens, and (3) Hungarian examples illustrating the strong seasonal variation in size.

Mr. H. M. Edelsten stated that it was proposed to introduce both the Dutch and Berlin races into different parts of the Eastern Counties.

Rare species of *Papilio*.—Mr. G. Talbot on behalf of Mr. J. J. Joicey exhibited the following Rhopalocera from the Hill Museum collection :—

Papilio jordani, Fruh., ♂ and ♀ from North Celebes, a species that is still rare in collections but has been rediscovered recently. The ♀ was made known by Van de Bergh in the *Tijdschr. v. Ent.*, 1920, p. 109, pl. xiv. Next to *P. idaeoides* it is perhaps the most striking female form of eastern Papilios. It bears a remarkable resemblance to a Danaine (also exhibited) *Nectaria blanchardi*, March., which is common in the same region.

Papilio idaeoides, Hew., and *Nectaria leuconoe*, Erichs., taken together at Davao, Mindanao, December 1922, a Papilionid and Danaine that strongly resemble one another in both sexes.

The evolution of the wing-pattern in Rhopalocera.—Mr. B. N. Schwanwitsch, a visitor, who illustrated his remarks with lantern slides, said : "A scheme, or, as he preferred to call it, a prototype of the wing-pattern of butterflies was published by him in the *Proc. Zool. Soc. London*, 1924. It was constructed in order to connect the wing-patterns of Satyrids, Morphids, Brassolids and Nymphalids with each other. Since its publication, the chief Palaearctic genera of Satyrids had been studied in detail in the Russian Academy of Sciences in Leningrad. This work had shown that all the most important wing-patterns of *Satyrus, Oeneis, Melanargia, Pararge, Epinephele, Erebia, Coenonympha* and *Triphysa* could be considered derivatives of the prototype. The modifications the latter undergoes in the genera referred to are extremely diverse, but the prototype undoubtedly represents a basis for the wing-pattern of all Palaearctic Satyrids.* The chief exotic genera of Satyrids were investigated as well. Though this study was only preliminary, it nevertheless showed that the prototype represents more or less the ground plan of the wing-pattern of the whole family of Satyrids.

"Wing-patterns in the Brassolidae, Morphidae and Nymphalidae are also connected with the prototype. For instance, whilst working in the British Museum, he had found that the well-known '88' design of American Nymphalid *Callicore* could be derived from the prototype by means of comparing it with a long series of representatives of *Perisama* and certain other allied genera.

"It is highly probable that all the wing-patterns of the big Nymphaloid complex

* This will be shown in a memoir which is now in preparation.

of families are derivatives of the same prototype. By the use of the method of analysis illustrated, it was hoped that the enormous variety of existing wing-patterns in Lepidoptera might eventually be made to take their places in an orderly plan."

Mr. N. D. Riley said that all the homologies suggested seemed to be quite clear and in accordance with his own views.

Mr. G. Talbot and Prof. E. B. Poulton asked if the hypothetic prototype had anything in common with ancestral wing-patterns.

Mr. Schwanwitsch explained that he ascribed no ancestral significance to his prototype since, being only a working scheme, it expressed only "geometrical interrelations." He added that in his opinion the phylogenetic constructions of zoologists are always very risky.

Dr. K. Jordan, in supporting Mr. B. N. Schwanwitsch's views, recalled Eimer's work and pointed out the error into which that author had fallen through confusing a scheme of organisation with a hypothetical ancestor.

Wednesday, March 17th, 1926.

Professor E. B. Poulton, F.R.S., President, in the Chair.

Election of Fellows.

The following were elected Fellows of the Society :—H. A. B. Harmsworth, 3, Marlborough Gate, Hyde Park, W. 2; Professor C. H. Kennedy, Ohio State University, Columbus, Ohio, U.S.A.; K. Mansour, B.Sc., Royal College of Science, South Kensington, S.W.; A. P. G. Michelmore, Saffron Close, Chudleigh, Devon; A. M. el Mistihawy, c/o Egyptian Educational Mission, 28, Victoria Street, S.W.; T. A. M. Nash, 16, Queen's Road, Richmond, Surrey; H. F. Newey, Craigmore, Coleshill Street, Sutton Coldfield; J. Shibuya, Hokkaido Imperial University, Sapporo, Japan; G. S. Skinner, Usine Ste. Madeleine, Trinidad, B.W.I.; H. Womersley, Sunny Meads, West Town, Nr. Bristol.

Exhibits.

An aberration of *Cosymbia linearia*, Hb.—Dr. E. A. Cockayne exhibited a male example of *Cosymbia linearia* ab. *fasciata*, Prout, from Epping Forest, and remarked that this aberration was described and figured from a single specimen taken in Epping Forest in 1908 by Mr. Betts.

An abnormal *Morpho menelaus*.—Mr. G. Talbot, on behalf of Mr. J. J. Joicey, exhibited and made remarks upon the following specimens from the Hill Museum, Witley :—

1. *Morpho menelaus*, L., aberration and ? gynandromorph from French Guiana, together with normal ♂ and ♀ from the same locality, also a ♂ *M. menelaus terrestris*, Butl., from Para. The *menelaus* shown has been described by Mons. F. Le Cerf in *Encyclopédie Entomologique*, B, iii, Lep. 1, fasc. 2, p. 102, 1925. It appears

to be an aberration of the race *terrestris* and to present the appearance of a gynandromorph.

2. A ♂ *M. menelaus* from French Guiana with the underside of left fore-wing showing female characters. This area shows large and well-marked ocelli as in the female, and a good deal of the grey-violet scaling of this sex on the distal region, together with a patch of the green female scaling proximally of the ocelli. The legs, abdomen and wing contour, appears to be as in a normal ♂.

3. *Charaxes doubledayi*, Auriv., a ♂ from the Kameruns, showing a patch of upperside scaling on the left fore-wing below. This patch is composed of scales having a strong bluish-green lustre and extends from cellule 3 to the inner margin. The green scales are mixed with colourless and black ones and are superimposed on a darker area of the brown ground-colour.

The tailed mimetic female of *Papilio dardanus hodsoni*, Poult., taken in S.W. Abyssinia by Mr. Arnold Hodson.—The President exhibited a female of the form *niavoides*, Kheil, in fine condition except for the loss of the left tail. It was taken by Mr. Hodson, 15 November, 1925, at the Got River (1700 ft.), in S.W. Abyssinia. A male and male-like female of *d. hodsoni* were captured on the same day, together with 5 examples of the Danaine model—*Amauris niavius*, L. On the preceding day, at the Apeny River (1700 ft.), Mr. Hodson took 3 males and 1 male-like female of *d. hodsoni* with 3 of the model. Some of the *Amauris* differed slightly from the Abyssinian race *n. aethiops*, Rothsch., in the size of the white patch on the hind-wing, indicating some little approach towards the pattern of the eastern race *n. dominicanus*, Trim.

The right tail of the *niavoides* female was not as long as that of the male, nor was it expanded into a spatulate extremity, but it was no smaller than the tail of one male-like female taken by Mr. Hodson or of some of the male-like females of *d. antinorii*, Oberth. Lord Rothschild's example of *niavoides* when fresh evidently possessed a long tail (*Proc. Ent. Soc. Lond.*, 1925, p. xlviii), and Haase's figures reproduced in the beautiful Plate X of Dr. Eltringham's *African Mimetic Butterflies* showed that the Prague *niavoides*, and *ruspinae* also, had long tails. It might therefore be inferred that the Abyssinian mimetic female *niavoides* resembled the non-mimetic male-like female in usually possessing long tails but not infrequently short ones.

The exhibited specimen being, except for the loss of a tail, in excellent condition, it became possible to see that the broad black border of the hind-wing was not developed by an extension of black markings like those of the male-like female, but by the appearance of a fuscous ground upon which these black markings, with their much darker shade, could be easily distinguished.*

Comparing the evolution of the *hippocoon* and *hippocoonoides* forms, as it could be traced in the Nairobi district, with that of the Abyssinian *niavoides* it appeared evident that the two histories were independent. A race of the same model was mimicked in each area, but the development followed different lines.

* Since these words were written my son Dr. E. P. Poulton has had the opportunity of examining Kheil's types of *niavoides* and *ruspinae* in the museum at Prague. He informs me that, in the hind-wing of both these female forms, the dark marks are distinctly visible on a fuscous ground, as in Mr. Hodson's example.—E. B. P.

In the Nairobi district, the development of the mimetic pattern from one resembling the male-like females of Madagascar or Abyssinia, can be traced in a long transitional series grouped under the female forms *dionysoides*, Auriv., and *trimeni*, Poult., all the members retaining the pale yellow fluorescent pigment of the male and ancestral female. The mimetic pattern of the fore-wing was produced, as Roland Trimen suggested in 1870 (*Trans. Linn. Soc.*, vol. xxvi, p. 497), by the extension of the black costal mark which enters the cell; that of the hind-wing by the increase in size and fusion of the black markings at and near the margin. The tail, lost very early, was only recognisable as a slight vestige in relatively few specimens. Then, at a later stage, the white non-fluorescent pigment replaced the yellow, the pattern became more defined and, with these changes, the mimics of *n. niavius* and *n. dominicanus* appeared as we see them to-day.

The evolutionary history was very different in Abyssinia, where the mimetic pattern was developed and the yellow pigment replaced by white, apparently without any reduction of the tail below the sizes now seen in the male-like females of the same area. Furthermore, the mimetic pattern of the hind-wing was produced as described on p. 6 by the development of a fuscous ground and not by an increase in the size and fusion of the markings.

The evolution of *niavoides* appears to have been more rapid than that of *hippocoon* or *hippocoonoides*, an inference supported by the more pronounced dyslegnic inner edge of the black markings of both fore- and hind-wing in the first-named form.

Dr. Jordan and Miss Sverdrup, who had seen the exhibited specimen of *niavoides*, agreed with the conclusion that it had been evolved independently of the corresponding southern mimics of *niavius*.

This conclusion was of great interest in relation to Darwin's argument that the path of evolution was never repeated, or identical species produced twice over along independent lines. Apart from the improbability of selection exerting the same kind of pressure at each step there was the fact that "variability depends more on the nature of the organism than on that of the environment" and therefore "the variations will tend to differ at each successive stage of descent." *

It might be thought, however, that in closely allied geographical races the path of evolution would repeat itself independently in two separate areas. Yet here, too, Darwin's conclusion was found to be valid. In the presence of a Danaine model with almost the same pattern, and presumably the same kind of pressure exercised by the same kind of enemies, the variational material offered to selection was different in the allied races, and therefore the path of evolution also differed.

Mr. Hodson was much to be congratulated on his success in obtaining the material which, it was believed, provided the correct solution of a puzzling problem, and threw light on an interesting and intricate aspect of evolutionary theory.

The Satyrine butterfly *Melanitis leda*, L., coming to light and entering houses.—The President exhibited two examples of *M. leda* sent to him from Java by Mr. Hubert W. Simmonds, who wrote from Batavia on 28 November, 1925 :—

* See Darwin's letter to *Nature*, vol. xliii, p. 415. This and other expressions of his opinion on the subject are quoted in *Darwin and the Origin*, Poulton, London, 1909, pp. 245–56.

"*Melanitis leda* comes into the houses here to light and some have sections out of the wings. I enclose two for you to see."

Both examples were wet-season forms with well-developed eye-spots on the underside. The form of the symmetrical injuries to the hind-wings suggested that they had been inflicted by lizards, perhaps house-lizards, which had attempted to seize the butterflies from behind.

Migration of the Pierine butterfly *Belenois mesentina*, Cram., at Nairobi.—The President said that he had received the following account from his friends Canon K. St. Aubyn Rogers and Dr. V. G. L. van Someren. The migration described was somewhat earlier than the one in 1924 recorded by Canon Rogers in *Proc. Ent. Soc.*, 1924, pp. xxxi, xxxii, and was also in the direction of the wind instead of across it (see, however, p. 9). Both migrations were towards the end of a strongly pronounced dry season.

"*Nairobi*, 30 *January*, 1926.

"It is still very dry here and the grass has turned quite brown again. It is also hotter than usual in Nairobi, the day temperature being between 85 and 90.

"The food-plant [of *Papilio dardanus*] is dessicated owing to the drought.

"There is another migration of *Belenois mesentina* going on. They suddenly appeared a few days ago and are steadily moving south before the northerly breeze. They are in no hurry and stop about, to feed on what flowers there are. No other species is migrating, and butterflies are generally rather scarce. Although *Catopsilia florella* is present, it is *not* migrating. I don't think that the *Belenois* have bred here, and I can see no indication that any are laying eggs, though I have the food-plant in my garden."

Dr. van Someren's letter, giving a later account of the migration, was also written from Nairobi. It was dated 10 February, but it was evident that the following paragraph carries the record up to the 12th :—

"There is a huge migration of *Belenois mesentina* going on just now. It started on 25.i.1926 and with one lull about 5.ii. has lasted until now (12.ii.26). They are going in a south-westerly direction, and I have records from Elgon, south to Kilimanjaro. To-day I was out for an hour at a favourite collecting ground, and, as it was dull, the insects were not active, but I saw some females hovering about a small bush and accordingly investigated. The bush was literally covered with eggs and young larvae just hatched. I brought the whole bush home and have just counted up the batches of eggs and larvae. There are 380 batches of eggs or larvae, the latter still crowded together. The average number of eggs in a batch is 150, so that the bush had on it 57,000 eggs and larvae. The whole bush measures 3 ft. 6 in. × 12 in. × 6 in. ! I enclose rough prints showing a batch of eggs and the bush. The popular idea is, that these Pierines are the result of the swarms of moth larvae which appear in grass country, and about which I wrote to you some time ago as being part of the contents of a Marabout's stomach."

The larva referred to was *Spodoptera abyssinia*, Guen. (Acronyctinae) recorded in *Proc. Ent. Soc. Lond.*, 1925, pp. xxxiv, xxxv.

If the breeze remained from the north when Dr. van Someren wrote, the migration seems at that time to have been obliquely across it.

Dr. van Someren's photographs of a batch of eggs and of the bush itself were exhibited to the meeting.

Further confirmation by Dr. V. G. L. van Someren of the attacks of *Hyperechia* (Asilidae) larvae upon the larvae of Xylocopid bees at Nairobi.—The President said that in reply to his letter informing Dr. van Someren of Dr. Kunhi Kannan's proof that an Indian *Hyperechia* larva preys upon the larva of its Xylocopid model (*Proc. Ent. Soc.*, 1926, p. 1), his friend had replied on 10 February, 1926 :—" I am glad to hear about the *Hyperechia*. I've examined quite a number of tunnels recently and have invariably found what I previously described " (*Trans. Ent. Soc. Lond.*, 1924, p. 121; *Proc.*, 1924, p. xxi).

The female of the leaf-like Tettigoniid *Mimetica*, and a leaf-like Geometrid moth from Costa Rica.—The President exhibited the specimens referred to in the following extract from a letter by Mr. C. H. Lankester :—

" *Las Concavas, Cartago, Costa Rica*, 8 *September*, 1925.

" At last (on 3 September) the lady *Mimetica* has come to hand. She is, as you see, of a dull fuscous brown. I took a dead leaf from the base of an Iris, but another remained which, caught in my fingers, proved to be very much alive.

" It is evident that this species is strictly nocturnal in activity. Since this capture another male has been found (a green one) during an evening prowl with an Everready lamp. It was sitting on the very sweet-scented flowers of *Epidendron* (*Nidema*) *pallaceum*. No signs of his having fed were visible, but probably, like *Cocconotus* and other noisome nocturnal pests, the flowers and young growths of orchids are very favourite food.

" I must apologise for the terrible state of the moth enclosed; it is one of those forms that add to their deceptive appearance by plication of the wings, all trace of which disappears after death."

In addition to the female *Mimetica* the three males shown to the Society in 1923 (*Proc.*, p. lxxxiii, fig. p. lxxxiv) and 1924 (*Proc.*, p. lxv), were again exhibited. Dr. P. Vignon had determined these males as belonging to three different species (*ibid.*, p. lxv), a conclusion which seemed improbable, inasmuch as they all came from Cartago, Costa Rica. If, however, they were distinct, the female resembled most closely the male determined as *Mimetica picteti*, Kirby, and represented in the uppermost figure on p. lxxxiv of the 1923 *Proceedings*. This male was slightly larger than the other two, and the female, as was to be expected, considerably larger still. The elytra of this male and of the female resembled brown leaves, paler and more variegated in the male, darker and comparatively uniform in the female. The strongly marked bays excavated in the costal margin of the elytra of all the males were represented in the corresponding part of the female elytra by a scalloped contour which rendered the likeness to an entire leaf still more convincing, but in no way suggested one that had been partially eaten.

A more detailed protective resemblance in the male was very unusual. Mr. G. J. Arrow, when shown the two sexes, considered, however, that the procryptic likeness

of the female was probably more efficient than the more elaborate resemblance of the male. It was to be remembered, on the other hand, that these insects could not always be leaf-like. Unleaf-like movements had to be made from time to time and, even in the position of rest, there were details which a sharp-sighted enemy might recognise as unleaf-like. It was suggested that such causes of suspicion were given by the male *Mimetica* more commonly than by the female and that the extraordinary detail of the former was specially adapted to meet the danger.

The above interpretation arose out of an observation made in 1887. The procryptic resemblance of the larva of our Geometrid moth *Cleora lichenaria* was equal to anything in the tropics, the colour and apparent texture of the lichen together with the deep shadow in its crevices being reproduced in the most wonderful perfection. A full-grown larva, offered to the European *Lacerta viridis*, was approached when it was made to move, but directly the movement ceased the lizard took no further interest. This was repeated more than once until suspicion finally became certainty and the caterpillar was devoured with avidity. The behaviour of the lizard was very striking and clearly showed that it had great difficulty in realising that the object was a caterpillar. This observation, briefly recorded in *Colours of Animals*, Internat. Sci. Series, 1890, pp. 40, 41, helped us to understand the value of elaborate detail in protective resemblance. It had been pointed out, however, that such detail as that of the male *Mimetica* would be a danger unless the bearer of it were rare (*Proc. Ent. Soc. Lond.*, 1924, pp. cxlv, cxlvi). To a common insect the outline of the female *Mimetica* would be a protection, that of the male a danger.

The moth sent by Mr. Lankester and taken at Cartago on 17 March, 1925, was a Geometrid (Boarmiinae), kindly determined by Mr. W. H. T. Tams as *Phyllodonta angulosa*, Cram. The fore-wings bore the indications of a longitudinal fold, and the resting attitude assumed in life was probably similar to that of another Boarmiine, the African *Coenina aurivena*, Butl., diagrammatically represented by Dr. G. D. H. Carpenter on p. lvii of the 1925 *Proceedings*. It was interesting that this attitude should be assumed independently by certain Geometrids, by Epiplemids and by Plumes. The moths which adopted it were generally much smaller than *Phyllodonta angulosa*.

Further observations on insects in Uganda by Dr. G. D. H. Carpenter.—The President communicated the following observations and exhibited the accompanying specimens sent to him by Dr. Carpenter. The series was a continuation of that recorded in *Proc. Ent. Soc. Lond.*, 1925, pp. liii–lviii. Dr. Carpenter had written 29 January, 1926, from Entebbe, pointing out that a statement on p. lvi was not strictly correct :—

"The 'chip of wood' in the bug (*Macrina*) observation does not quite describe the thing that was sent. I ought to have said 'the burnt stubble of the large grass-stems that occur in that country.' One often finds bits like that lying about. I suppose they get broken off."

Concerning the habits of the predaceous bug *Mononyx*, referred to on p. lv and also in the *Proceedings* of 1915, pp. lxiii, lxiv, Mr. W. E. China had kindly directed attention to Uhler's statement that the allied N. American species *Gelastocoris*

oculatus watches for its insect prey on the low banks of streams, "leaping suddenly upon one of them, clasping it with tight embrace between the front femora and tibiae, and then sucking out all its juices." *

"25 *November*, 1925. *Lukung Camp, Chua Distr., N. Prov., Uganda.*

"*Ant-like larval* '*Locustids*.'—Running on a stem of a bush were a number of young 'Locustids,' extremely ant-like in all movements. What made me examine them closely was that a patch of bright green showed on the dorsum which didn't seem ant-like. The black colour on the green very well represents an ant. The antennae are thicker for about the right distance from the base and the filiform distal part hardly shows. In gait they ran just like an ant and only jumped when actually boxed. There were older specimens in which, being too large to be ant-like, the green predominates, and a single larger specimen also on the bush I took to be the same species. The young ones were the best ant-grasshoppers I have seen."

[The series included various stages, one nearly mature, of a Tettigoniid of the genus *Eurycorypha* (*Myrmecophana*), founded on an ant-like larva described as a species under the name *M. fallax* by Brunner. The life-history had been established by Vosseler, and an interesting paper by Mr. B. Uvarov, on the transition from Mimetic to Protective resemblance in these and other TETTIGONIIDAE appeared in *Trans. Ent. Soc.*, 1922, p. 269. (See also *Proc.* 1922, p. xlvii.) Mr. Uvarov, who kindly examined the exhibited specimens, had determined the genus, but no further identification was possible with immature material.]

"6 *May*, 1925. *Pabbo Camp, Gulu Distr., Uganda.*

"*Mimetic Resemblances between beetles*.—The association in pairs of CICINDELIDAE and CARABIDAE, the latter apparently mimicked by the former, has often been noticed. I have, however, not hitherto found the very nice large Cicindelid which, with its Carabid model, is now sent. They were taken on the road on the same day (6 May) at the same place."

[The Carabid model was kindly determined by M. Alluaud of Paris as *Piezia quinquesignata*, Fairm.; the mimic by Dr. W. Horn of Berlin as *Cicindela kolbei*, subsp. *dispersesignata*, Horn. Both species appear to be very rare in collections. For analogous associations observed by Dr. Carpenter and Dr. G. A. K. Marshall see *Proc. Ent. Soc.*, 1918, pp. xcvii, xcviii and references.]

"27 *May*, 1925. *Ajumani, Gulu Distr., Uganda.*

"*A Meloid* (*Cantharid*) *beetle mimicking a Lycid beetle*.—I took this evening on a grass stem a Lycoid beetle which, until I had examined it, I thought was a Malacoderm, like *Telephorus*, etc. But it appeared to be a Cantharid—I am not sure that I remember having ever seen it before. If you think it worth exhibiting with the other specimens commented upon in this letter, will you do so?"

[The specimen, which is not in the British Museum collection, was, by the kind help of Mr. K. G. Blair, doubtfully determined from figure and description as *Zonitoschema alluaudi*, Pic. Four species of Meloid (Cantharid) beetles with the

* Quoted by Hungerford in *Kansas Univ. Sci. Bull.*, vol. xi, Dec. 1919, p. 50.

Lycoid pattern are figured in Dr. G. A. K. Marshall's paper—*Trans. Ent. Soc. Lond.*, 1902, pp. 515–18, pl. xviii, figs. 20–23.]

"23 *May*, 1925. *Dufile Camp, Gulu Distr., Uganda.*

"*A musical Mutillid.*—The stridulating powers of Mutillids must be as well known to all observers as they are to me, but the specimen sent eclipses all I have seen. When put in a box it emitted such a twittering little song that I thought I must be mistaken and that the noise was made by some bird at a little distance. The 'song' was of several notes rapidly alternating: it might be compared to the noises emitted by a child's compressible rubber toy animal. The specimen shows on the anterior margin of one abdominal segment a transverse hairless area across the whole width of the body. Mid-dorsally on this area is an oval patch which is so finely striated that under a lens it has a beautiful iridescent appearance. The alternate rapid contractions and expansions of the terminal segments of the abdomen which accompany the production of the song presumably cause this striated area to rub against the posterior margin of the segment in front.

"Stridulating insects are many—Longicorn beetles, for instance, produce a squeaking noise by nodding movements of the head—and a common *Dirphya*, captured by my experimental monkey (see *Trans. Ent. Soc.*, 1921, pp. 23, 67), certainly aroused the monkey's interest by its noise. This same monkey would eat Mutillidae, but was very quick to rub them on the ground so as to disable them and avoid the sting. There are many mimics of Mutillids among beetles, spiders, and even bugs, but this subject would require a note to itself."

[With kind help of the Rev. F. D. Morice the female Mutillid was determined as *Dasylabris deckeni*, Magr., s.-sp. *signaticeps*, André.*]

"4–5 *April*, 1925. *Bukassa Isle, N.W. Victoria Nyanza.*

"*Fossorial wasp and its prey.*—The Fossor was taken carrying the weevil which is sent with it."

[The Fossor appeared to be *Cerceris rufiscutis*, Cam., ♀; its prey has been kindly determined by Dr. G. A. K. Marshall as a species of the difficult genus *Systates*.]

Further notes of Dr. Carpenter's on spiders mimicking ants and Mutillidae were postponed until the species have been as far as possible determined.

A Nyasaland Pompilid with unusual prey. Complete recovery of prey after being stung.—The President said that he had received the little Pompilid exhibited to the meeting, together with the following note, from his friend Mr. W. A. Lamborn:—

"*Fort Johnston:* 20 *March*, 1925.—Small Fossor leading a nymph of the common Blattid by its antennae up the wall. Antennae were bitten off to about half their length, the cockroach being in a stupefied state. It commenced to feed on 24 March, having passed excreta before this. On 7 April it was found to be

* Dr. H. Bischoff, who has kindly examined the specimen, considers that it is not quite the typical form of *signaticeps* but transitional towards the f. *divisa*, Bisch.—E. B. P.

growing and its antennae had been regenerated. Its activity was then normal. A moult was seen on 31 August, the insect eating the cast cuticle. It was very active at this time. On 10 October it is still alive and being regularly fed."

The Fossor was kindly determined by Mr. B. Uvarov as a species of *Psammochares* not in the collection of the British Museum. That a Pompilid should store up cockroaches instead of the usual spider-prey was very remarkable, but the determination had been confirmed by Dr. R. C. L. Perkins, who had kindly examined the specimen and written concerning it :—" The specimen is a *Psammochares* (*Pompilus*), but in a rather wide sense of the generic name. Its rather striking superficial characters in several respects—its strongly bifid claws, with the shorter tooth strong and well developed; the absence of a well-developed ' pecten ' on the front tarsi, and unusual armature (of fine and few spines) on these ; the hind legs being strongly spinose—should make the species easy to identify, if it has ever been properly described."

The recovery of the Blattid was most interesting, and it was believed that the regeneration of injured parts after the sting of a Fossor had never been recorded before. The recovery of cockroaches after the sting of their usual Fossorial enemies the Ampulicidae had been described in Major A. R. Hingston's interesting book. *Nature at the Desert's Edge*, to which Mr. Uvarov had kindly directed attention, The author also showed that this recovery was a normal occurrence, but that it did not help to save the victim securely confined in the wasp's cell and bearing an egg and afterwards a larva which it could not reach.

Ants and their Hemipterous and Ichneumonid (Cryptinae) mimics observed together at Como, Italy.—The President exhibited examples of the ants and their mimics referred to in the following letter by Mr. S. Stuart Light :—

" 18 *September*, 1925.—I took these insects at Como, running about on leaves in hedges by the roadside. In each case, there were several insects of both kinds apparently associated with each other in some way.

" The likeness was particularly noticeable in the ant and Capsid pair, where the form and colouring of the bug seems to be curiously adapted to resemble the ant. You will notice that the hemelytra are divided and rounded off, giving the appearance of the abdominal segments of the ant.

" In the other pair the resemblance is not so obvious; but the disparity was not always so great as in the specimens I send you. The wingless Ichneumonid possesses the same colouring, both of body and legs, and the abdomen is unusually like that of an ant—rounded and without a very long ovipositor."

The first-mentioned pair included the ant *Lasius emarginatus*, Oliv., ♀, and the Capsid bug *Pilophorus perplexus*, D. & S.; the second pair—the ant *Formica fusca*, L., with an Ichneumonid of the genus *Pezomachus* which Mr. Claude Morley had kindly examined and found to be the British species *P. anthracinus*, Först., ♀. The ants had been kindly named by Mr. W. C. Crawley, the Capsid by Mr. W. E. China, who had pointed out that the myrmecophilous habits of *P. perplexus* were described by the late E. A. Butler in his *Biology of British Hemiptera Heteroptera* (London, 1923, p. 472), having been observed by Douglas and Donisthorpe as well as the author,

to be associated with various species of ants, but apparently not hitherto with *L. emarginatus*.

A method of making outline drawings from photographs.—The Rev. F. D. Morice exhibited some outline figures of structural characters in the antennae of various Sawflies belonging to the Family Cephidae. These figures had been produced by the following method. Microphotographic prints of the objects were first made at a magnification of about 15 diameters. Then, on these prints, the exact outlines of the antennae, joint by joint, were inked over with a fine " mapping-pen " and Indian ink. When the ink had thoroughly dried, the prints were placed in a solution of potassium cyanide, which sooner or later—according to the strength of the solution—entirely removed the silver image, without in any way affecting the Indian ink. The prints were then left in *very gently running* water to wash out the cyanide, and allowed to dry, the process being then completed. Any sort of paper (P.O.P., with or without toning, Bromide, Gaslight paper, etc., developed with any developer) can be employed in the process, and any defects in the prints as photographs are of no consequence, since the cyanide, if allowed to act long enough, removes all marks and stains, and leaves only the inked outlines on a ground of perfectly clean white paper. The conversion by some such process as the above of a Bromide Print into a line-drawing was described in 1902 by the Rev. F. C. Lambert in *The Amateur Photographer*, Library, No. 26, p. 59; but the exhibitor believed that at any rate in this country, the method had been seldom, if ever, applied to entomological purposes; and having found that it had much interested several Fellows to whom he had shown these figures, he had thought it worth while to bring the matter to the notice of the Society.

Papers.

The following papers were read :—

1. " Further Records of Insect Migration," by Mr. C. B. Williams, M.A.
2. " Homoeosis and Heteromorphosis in Insects," by Dr. E. A. Cockayne, M.A.
3. " On the type specimens of certain Hesperiidae (Lep.) described by Latreille," by Mr. N. D. Riley.
4. " Insect Visitors to Sap-exudations of Trees," by Mr. G. Fox-Wilson.

Wednesday, April 7th, 1926.

Dr. H. Eltringham, M.A., Vice-President, in the Chair.

Election of Fellows.

The following were elected Fellows of the Society :—Miss J. Barrington, B.A., St. Leonards School, St. Andrews, Scotland; Mrs. O. A. Merritt Hawkes, M.Sc., B.Sc., 405, Hagley Road, Edgbaston, Birmingham; V. V. Nikolsky, Cotton Committee, Armiansky, per 2, Moscow, Russia; Dr. S. H. Skaife, M.A., Dept. of Education, Cape Town, South Africa.

Exhibits.

The early stages of *Rhodafra opheltes*.—Mr. H. M. Edelsten on behalf of Mr. Gurth Edelsten in the Orange Free State, communicated the following particulars of larva and pupa of *Rhodafra opheltes*. Two larvae were found feeding on the flowers of White Scabious, one late in Dec. 1925 and the other early in Jan. 1926. The larvae were about 2 inches long, with yellowish-green bodies, a light green head and a short reddish horn with a black tip. Three grey lines down centre of back (middle one narrower than the others) and immediately below these a row of 11 spots on each side, oval in shape, white with red centre and a black border. On each flank in line with the spiracles an irregular row of minute spots, white with black border, giving as a whole the impression of a grey line. When fully grown the larvae spun a loose cocoon in the grass on the surface of the soil at the foot of their food-plant, and the moths emerged about 3 weeks after pupation. Pupa pale yellowish brown, with a prominent rounded projection at head, and clearly marked with dark brown on wing-covers and around spiracles.

Dr. Jordan said that though this moth had been bred some years ago by Mr. G. F. Leigh of Durban, no description of the larvae had previously been published.

A Hybrid Coccinellid.—Mr. N. D. Riley on behalf of Mr. T. F. Marriner, communicated the following :—

" As the result of some experiments in the study and breeding of various local Coccinellids I would like to submit the following for consideration. In the case of *Adalia bipunctata*, there are forms such as ab. 4-*maculata* and ab. 6-*pustulata* which have become fixed and are known to breed true. Many of the variations, on the other hand, appear to be so evanescent as not to be worth considering so far as special naming is concerned. It is to one of these variations from the normal to which I should like to call attention and upon which I should like to submit the results of some five years' experimental work both in the open and in breeding-boxes. The variety is found, I should think, in the collection of every one who has collected our Coccinellidae, and is, I believe, generally classified as a variety of *Coccinella variabilis*, Ill.,* even when, as is frequently the case, it has the black legs usually considered as the distinguishing characteristic of *A. bipunctata*.

" Briefly outlined one experiment was as follows :—

" No. 1. ♂ of type *bipunctata* mated with ♀ of type *bipunctata* produced 3 type forms and one variant, the variation consisting of a larger area of black surface. This specimen I will call ' X.'

" No. 2. ♂ of *C. variabilis* mated with ♀ type *bipunctata* produced 3 imagines all tending to the dark form, and all of which would, I think, be classed as *C. variabilis* if submitted to expert opinion, without their origin being stated, in spite of the fact that 2 had black legs.

" No. 3. A similar mating to No. 2, produced only one imago, which I call ' K.'

" No. 4. K♂ was mated with X♀ and produced insect ' Y.'

" This was in 1922.

* [Now known as *decempunctata*, L.—Ed.]

" Each year since then matings have been made between insects of ' Y ' types and, except for a slight variation in size and coloration—not the shape—of the spots and the legs being sometimes black, sometimes yellow, and the first brood of each year being somewhat paler in colour, there has been no variation, except a percentage of reversions to the original form of *A. bipunctata* or *C. variabilis*.

" Here, then, I may reasonably assume is what might be termed a stabilised ' natural ' form or a variation due to hybridisation. According to the laws of hybridisation the offspring of such a form ought to be either nil or an entire reversion to type. So far I have definitely established the following points concerning this form Y.*

" A. I have found it wherever *A. bipunctata* and *C. variabilis* are found together, and it is commoner in my own collecting grounds in autumn than either of the type forms. The experience of correspondents agrees with this, but I would like the experiences of others.

" B. Specimens bred early in the year, 1st brood, are usually of lighter colours than those found in the autumn. This is, I think, generally true of *A. bipunctata*, of which black forms will stand heat better than the normal or type form.

" C. It will stand a much greater range of temperature than the type forms of either *A. bipunctata* or *C. variabilis*, and is much easier to rear through the larval stage.

" D. It has a more voracious and even more catholic appetite than type forms, and because of C and D it should prove of more economic value than the type form.

" So far as classification is concerned it seldom, one might almost say never, altogether agrees with Fowler's description of either *A. bipunctata* or *C. variabilis*, possessing at one time more of the *C. variabilis* characteristics, at another more of the *A. bipunctata*, though on the whole it may be said to lean rather to *C. variabilis*. Probably that is why it is usually classified as a variety of *C. variabilis*.

" E. There is a Coccinellid commonly met with in Nyasaland and throughout East Africa in the cooler areas which, so far as spot, shape and distribution is concerned, exactly resembles the Y variety, and this too may be the result of natural hybridisation.

" F. In one of my favourite camping and collecting grounds I have found the variety in hundreds every summer, and from here it seems to have spread and to be spreading year by year to areas round about.

" So far as I can discover this variation has never received a name, and since it is, in my opinion, of hybrid origin, with possibly on the whole a leaning towards *C. variabilis* and is so easily distinguishable, I consider it deserving of one."

In the discussion that followed considerable doubt was expressed as to whether the two Coccinellids in question are really distinct species, although placed by Coleopterists in separate genera, and Mr. Main suggested that further work on the larvae was desirable.

The Hibernation of *Pyrameis cardui* in Britain.—Mr. C. B. Williams drew attention to a statement made by Mr. J. Fletcher in 1901 (*Ann. Rept. Ent. Soc. Ontario*, 1901 (1902), p. 54) with regard to the hibernation of the Painted Lady

* [Recorded as hyb. *biabilis*, *Ent. Rec.*, xxxviii, p. 83, June 1926.—Ed.]

THE ENTOMOLOGICAL SOCIETY OF LONDON

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MEETINGS

TO BE HELD IN THE SOCIETY'S ROOMS

41, QUEEN'S GATE, S.W. 7

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The Chair will be taken at Eight o'clock.

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